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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,616	05/25/2005	John Gordon Rushbrooke	920602-97103	2226

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EXAMINER	
MIDKIFF, ANASTASIA	
ART UNIT	**PAPER NUMBER**
2882	

NOTIFICATION DATE	DELIVERY MODE
11/13/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent-ch@btlaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/501,616	RUSHBROOKE ET AL.	
	Examiner	Art Unit	
	Anastasia Midkiff	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *67,68,73,76,79,81-83,93,96 and 97* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *67,68,73,76,79,81,82,93 and 96* is/are allowed.

6)☒ Claim(s) *83 and 97* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 83 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent to Sugimoto (US 4,542,519).

With respect to Claim 83, Sugimoto teaches a material discrimination detector for x-ray inspection using high energy x-rays including:

- a thin front crystal having two opposite side faces;
- wherein the crystal is read out from each side face by a photodiode; and,
- wherein the output signals from one side face of the crystal is added to the output signal from the other side face, reducing any left/right asymmetry in the output signals.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent to Grodzins et al. (USP# 6,151,381) in view of U.S. Patent Application Publication to Rivard (PGPUB# 2003/0204126).

With respect to Claim 97, Grodzins et al. teach a material discrimination system for X-ray inspection (Figure 1, and Column 2 Lines 37-40) of high energy X-rays which includes a Linac (50, H or V) for generating high-energy x-rays (Column 2, Lines 37-40), wherein the Linac (50, H or V) is pulsed and triggered on alternate pulses only (Column 5, Lines 36-50, and Figure 4), and a detector with crystals (26, 28), wherein a read-out system is synchronized to the Linac pulse with one read-out cycle for each pulse (Column 5 Lines 37-50, and Column 6 Lines 46-50).

Grodzins et al. do not teach that the read-out system also samples the output from detector crystals between each Linac pulse.

Rivard teaches a radiation read-out system for a pulsed radiation source which samples signals during "dead time" (non-radiation-emission-time) to obtain a background noise count rate, and subtracts this background noise count rate from subsequent detector readings for samples examined (Paragraph 218).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the background calibration of Rivard between the Linac pulses of Grodzins et al. to remove background noise from the detector and improve accuracy of sample readings, as taught by Rivard (Paragraph 218).

Response to Arguments

Applicant's arguments with respect to claim 83 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 07 September 2007, with respect to the 35 USC 103(a) rejection of Claim 97 as being unpatentable over Grodzins et al. in view of Rivard have been fully considered but they are not persuasive.

With respect to the Rivard reference, the Applicant asserts that Rivard does not teach read out of signals for which a Linac is pulsed but not triggered, because Rivard teaches generation of signals during dead time or non-pulse-time to remove background noise. The examiner respectfully disagrees.

In response to applicant's argument that Rivard does not teach Linac pulses or triggering on alternate pulses only, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Grodzins et al. was relied upon for a material discrimination system using a Linac (50, H or V) in which the Linac is pulsed (Figure 4), and wherein the Linac (H or V) is triggered on alternate pulses only (H or V, Figure 4). Rivard teaches reading out signals from a radiation detector during a time of non-irradiation, to provide a measure of background noise that may be subtracted from the x-ray image to improve resolution in

the x-ray image (Paragraph 218), wherein said measurement used in the device of Grodzins would also remove noise due to crystal persistence.

The examiner further notes that the claim is directed toward an apparatus, not a method, and that the apparatus of Grodzins et al., as modified by Rivard, is as capable of removing background noise due to crystal persistence as is the applicant's invention.

Allowable Subject Matter

Claims 67, 68, 73, 76, 79, 81, 82, 93, and 96 are allowed.

With respect to Claim 67, the prior art of record teaches many of the elements of the claimed invention, including a material discrimination system including: a high energy x-ray source; a first detector component in the form of a thin scintillation crystal for registering an amount of energy deposited by an x-ray that is essentially independent of the x-ray energy; a thicker one-piece downstream scintillation crystal; a low-z converter situated between the thin crystal and the thicker crystal to stop electrons produced by x-ray interactions downstream of the thin crystal from being significantly backscattered into the thin crystal and prevent electrons leaving the thin crystal from returning and depositing more energy in the thin crystal; a plurality of read-out devices for detecting light energy emitted by the crystals and generating respective electrical output signals in response thereto; wherein a pair of read-out devices is provided to read out from opposite sides of the crystals; and wherein the output signal from one readout device on each side of the crystals is added to the output signal to reduce any left/right asymmetry in the output signals.

However, prior art does not teach or fairly suggest the system wherein the pairs of read-out devices on the thicker crystal read out at different respective depths in the beam direction, in the manner required by Claim 67.

With respect to Claim 93, the prior art of record teaches many of the elements of the claimed invention, including a method of manufacturing a material discrimination detector for use in an x-ray discrimination system for x-ray inspection using high energy x-rays including: separate front and rear scintillation crystals; and a low-z converter between the front and rear crystals.

However, prior art does not teach or fairly suggest the method further comprising a step of cutting the front and rear crystals from the same ingot of material, in the manner required by Claim 93.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patents to Levinson (US 5,517,544) and to Schulz (US 5,923,722) teach x-ray devices with methods of removing afterglow effects in the detectors.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anastasia Midkiff whose telephone number is 571-272-5053. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASM
11/6/07

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER